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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/633,357

**Applicant(s)**

HEDLUND ET AL.

**Examiner**

JUSTIN M. PATS

**Art Unit**

3623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 May 2010.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 3-22, 25-34 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1, 3-22, 25-34 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/GS/US)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Notice to Applicant***

1. The following is a Final office action. In response to Examiner's communication of 2/22/10, Applicant, on 5/20/10, amended claims 1 and 21. Claims 1, 3-22, 25-34 are pending in this application and have been rejected below.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
4. Claims 1, 3–12, 15–16, and 18–19 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Brien, U.S. Pat. 6,587,831 (see PTO-892, 2/28/2008, ref. C) in view of Burke et al., *Variable Neighborhood Search for Nurse Rostering Problems*, Kluwer Academic Publishers, 12/19/2002, pg. 1–21 [hereinafter Burke] further in view of Chun et al., *Nurse Rostering at the Hospital Authority of Hong Kong*, American Association for Artificial Intelligence, 2000, pg. 1–6 [hereinafter Chun] further in view of Burke et al., *Fitness Evaluation for Nurse Scheduling Problems*, Proceedings of Congress on Evolutionary Computation, CEC2001, Seoul, IEEE Press, 2001, pg. 1139–46 [hereinafter Burke 2].

5. As per claim 1, O'Brien teaches a computer implemented method for automatically generating an optimized workforce schedule, comprising:

in a scheduling server (Fig. 1, ref. 110, Host; col. 3, lines 23–38, discussing host server capabilities), processing past schedules using a pattern recognition procedure to recognize historical shift patterns for a particular position indicated in the past schedules (Fig. 4; col. 5, lines 10–13, 25–37, 48–62, discussing the forecasting module analyzing intrinsic company workload data to derive optimal shift patterns and staffing requirements), wherein the historical shift patterns comprise a resource dependent shift pattern and a time dependent shift pattern (col. 5, lines 30–33, discussing workload records and final staffing requirements for each shift being analyzed; lines 35–37, discussing patterns of high and low volume for various times of the day being found); and in the scheduling server, creating an initial workforce schedule and refining it based on historical shift patterns and employee attributes to generate an optimized workforce schedule based on the initial workforce schedule, forecasted demand, and employee preferences (Fig. 2, refs. 230 and 250; Fig. 4, refs. 420 and 450; col. 5, lines 48–62, col. 5, line 65–col. 6, line 2; col. 1, lines 49–51, discussing employee preferences which are taken into account in devising a schedule) but does not explicitly create the initial workforce schedule based on the historical and attribute data and then refine it to generate the optimized workforce schedule. However, Burke, in the analogous art of nurse rostering problems, teaches this concept of refining an initial solution by using a neighborhood search algorithm (pg. 14–15, “Starting from an initial solution, local search is applied in the first neighbourhood. If the local optimum thus found is better than the current best solution, the algorithm moves there and continues the search in the first

neighbourhood; otherwise, it employs the next neighbourhood and applies the corresponding search method. The algorithm stops when the search in the last neighbourhood does not lead to an improvement.”; Fig. 4, showing a search routine wherein the steps are reiterated until the best solution is found). It would have been obvious to one having ordinary skill in the art to modify O’Brien to include the teachings of Burke, providing the benefit of a more accurate schedule and therefore a more efficient implementation of the workforce.

O’Brien in view of Burke does not explicitly teach use of a ratio dependent shift pattern based on when a certain number of a first type of position must be scheduled with a certain number of a second type of position, in its shift scheduling analysis. However, Chun, in the analogous art of nurse rostering via constraint satisfaction problem modeling, teaches ratio dependent shift patterns based on when a certain number of a first type of position must be scheduled with a certain number of a second type of position (pg. 3, Manpower Demand Constraint, “This type of constraint defines manpower requirement for a specific rank, staff group, gender or their combination in a particular shift, as well as the alternative manpower demand patterns in case the original demand cannot be satisfied. For example: □ Exactly 4 registered nurses on Monday morning can be replaced by 3 registered nurses and 1 enrolled nurse or by 2 registered nurses and 1 student nurse.”). Although not explicitly recognized in the context of a historical shift pattern, applying the known technique of historical shift pattern recordation and use to predict future shifts, as taught by O’Brien as discussed above, as well as by Burke (pg. 13, “Possibilities exist for starting from . . . the schedule of the previous planning period . . .”) and Burke 2 as discussed below, to a known element, namely a ratio dependent shift pattern based on when a certain number of a first type of position must be scheduled with a

certain number of a second type of position, would have been obvious so as to produce a predictable result and result in an improved system that maximize the productivity of available resources, avoiding the wasteful scenario wherein capable workers are not assigned to a potential job merely because they are unaccustomed to performing said job and therefore such an arrangement goes unrecognized by the scheduling means.

O'Brien in view of Burke does not explicitly teach wherein the resource dependent shift pattern is based on when a resource is working a particular position. However, Chun teaches this concept because its rostering engine takes into account historical staffing data including when a resource is working a more or less desirable shift (pg. 4, "In addition, our Rostering Engine ensures that all staffs are treated fairly by using different types of historical statistics to generate the roster. The statistics indicate how "well" each staff has been treated so far, in terms of the number of more desirable or less desirable shifts assigned in the past. Based on the statistics, the Rostering Engine tries to evenly assign "good" shifts to balance out the statistics"). It would have been obvious to one having ordinary skill in the art to modify O'Brien in view of Burke to include the teachings of Chun for the benefit of maintaining employee productivity by providing them a fair and balanced shift schedule, avoiding the perception or reality of employee bias.

O'Brien in view of Burke further in view of Chun does not explicitly teach wherein the time dependent shift pattern is based on when a specific task needs to be performed. However, Burke 2 teaches this concept in the analogous art of nurse scheduling problem analysis (pg. 1142, Tables 2 and 3, showing previous planning period data to be used in initialization of solution for the current planning period, the previous planning period data including particular times of shifts, morning M, late L, or night N (see Table 1) when shift-related tasks needed to be

performed by people P1–P5). It would have been obvious to one having ordinary skill in the art to modify O'Brien in view of Burke further in view of Chun to include the teaching of Burke 2 for the benefit of a more focused analysis that meets staffing requirements while maximizing usage of time available for resource productivity.

6. As per claim 3, O'Brien does not explicitly teach wherein employee attributes comprise an employee's skill set. However, Burke teaches this limitation (pg. 3, "Qualifications reflect the skills of the personnel. They normally depend on experience, level of education, etc. People can have an authority to replace personnel members with a different skill category."; pg. 13, "Shifts are added and/or removed randomly in order to satisfy the personnel demands for every skill category, thus satisfying the hard constraints."; "The nurse rostering problem is solved by scheduling each skill category separately."). It would have been obvious to one having ordinary skill in the art to modify O'Brien to include the teaching of Burke, providing the benefit of increased efficiency and productivity with respect to a company's work product by assigning qualified personnel to jobs demanding such.

7. As per claim 4, O'Brien teaches wherein employee preferences comprise an employee's desired number of hours (col. 4, lines 13–18, 30–39).

8. As per claim 5, O'Brien teaches receiving a forecasted demand as input (col. 3, lines 35–37, discussing the prospective use of forecasted workload demand from extrinsic information input to initiate a modification to the schedule; Fig. 4, ref. 420, Generate Workload Forecast; col.



5, lines 53–58) but does not explicitly apply this known technique to the particular refining step of claim 1, which is refining an already initially solved problem. However, applying this known concept to the particular refining step of claim 1 would have been obvious so as to produce a predictable result of a more accurate schedule and result in an improved system with enhanced operational efficiency.

9. As per claim 6, O'Brien does not explicitly teach wherein the forecasted demand is for a single employee position. However, O'Brien discloses wherein scheduling and preference data for each position is individually documented, and monitored for use in the analysis (col. 3, line 63–col.4, lines 9, Business Parameters). As such, applying the known technique of workforce demand forecasting to a known element, namely a single employee position, would have been obvious so as to produce a predictable result of a targeted demand forecast, resulting in an improved system that is better able to pinpoint the root cause of inefficiencies and therefore facilitate their remedy.

10. As per claim 7, O'Brien teaches wherein the forecasted demand is for multiple employee positions (col. 3, lines 35–37, discussing the prospective use of forecasted workload demand over the entire workforce from extrinsic information input to initiate a modification to the schedule; col. 5, lines 53–58, discussing forecasted ).

11. As per claim 8, O'Brien teaches generating an optimized workforce schedule based on resource availability (col. 4, lines 13–20, discussing employee availability as an element of

employee data, lines 51–52) but does not explicitly apply this known technique in the particular refining step of claim 1, which is refining an already initially solved problem. However, applying this known concept to the particular refining step of claim 1 would have been obvious so as to produce a predictable result of a more accurate schedule and result in an improved system with enhanced operational efficiency.

12. As per claim 9, O'Brien teaches generating an optimized workforce schedule based on a predefined number of work hours per week for an employee (col. 3, lines 63–66, business Parameters, minimum hours per schedule per position; col. 4, lines 13–18, Employee data, minimal hours of work per schedule, lines 30–39) but does not explicitly apply this known technique to the particular refining step of claim 1, which is refining an already initially solved problem. However, applying this known concept to the particular refining step of claim 1 would have been obvious so as to produce a predictable result of a more accurate schedule and result in an improved system with enhanced operational efficiency.

13. As per claim 10, O'Brien teaches generating an optimized workforce schedule based on various employee availability (col. 4, lines 12–13, 19–20, 25–27, discussing availability as data input of each employee; col. 4, lines 51–58, discussing use of availability data in calculating optimal schedule; col. 9, lines 17–26, disclosing that availability can be changed from availability just on weekdays to weekdays and weekends) but does not explicitly apply this known technique to the particular refining step of claim 1, which is refining an already initially solved problem, nor does it explicitly mention full time and part time availability as inputs.

However, applying this known concept of employee availability consideration to the particular refining step of claim 1 would have been obvious so as to produce a predictable result of a more accurate schedule and result in an improved system with enhanced operational efficiency.

Furthermore, Burke teaches both full time and part time employee availability as a scheduling constraint (pg. 4, Constraints defined by the work regulation, taking into account the constraints of full time, part time, and night personnel in the schedule optimization calculation) and refining of the initial schedule as discussed in claim 1. As such, it would have been obvious to one of ordinary skill in the art to modify O'Brien to include the teachings of Burke because the claimed invention is merely a combination of old elements, and in the combination each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

14. As per claim 11, O'Brien teaches receiving a modification to the optimized workforce schedule from a user (*see e.g.*, col. 3, lines 35–38, wherein a modification to the schedule can be proposed by user; col. 4, lines 25–27, wherein each employee can access host to modify or input availability data and request data; col. 7, lines 19–32, discussing a shift change initiated by employee).

15. As per claim 12, O'Brien teaches wherein the modification is received via an input device configured to provide changes for a particular resource through a user interface (col. 3, lines 11–17, discussing use of standard computers to access host. In order to input modifications to the schedule in a computer, some kind of input device is used).

16. As per claim 15, O'Brien in view of Burke further in view of Chun does not explicitly teach wherein the forecasted demand comprises multiple forecasts for a particular position. However, producing a demand forecast for a particular position was rendered obvious by O'Brien as discussed above in the rejection of 6 above. Also, O'Brien has the capability to perform demand forecasts at different times and hence multiple forecasts (col. 1, lines 16–20; col. 8, lines 47–50; col. 14, lines 20–22). As such, it would have been obvious to one of ordinary skill in the art to modify O'Brien because the claimed invention is merely a combination of old elements, and in the combination each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable, enabling a scheduling manager be better prepared and make more informed decisions by being aware of different demand scenarios for a particular position. Furthermore, it is noted that reiterating the demand forecasting process to attain another forecast for the same position can be reasonably considered mere duplication of parts for multiplicative effect, which has no patentable significance unless new and unexpected result is produced. In re Harza, 124 USPQ 378 (CCPA 1960); St. Regis Paper Co. v. Bemis Co., 193 USPQ 8, 11; 549 F2d 833 (7th Cir. 1977). Here, the predictable result of a second demand forecast for the position is neither new nor unexpected.

17. As per claim 16, O'Brien teaches wherein the resources selected for the initial workforce schedule are predefined (col. 4, lines 3–4).

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18. Claim 18 recites limitations that stand rejected via the neighborhood search algorithm teachings of Burke in combination with the other art citations and rationale applied to claim 1 as discussed above.

19. As per claim 19, O'Brien teaches wherein employee resources are located in a centralized pool of resources (col. 3, lines 24–30, 55–61. All employee resources and associate data is received and maintained in the host server).

20. Claims 13–14 are rejected under 35 U.S.C. 103(a) as being unpatentable over O’Brien, U.S. Pat. 6,587,831 in view of Burke et al., *Variable Neighborhood Search for Nurse Rostering Problems*, Kluwer Academic Publishers, 12/19/2002, pg. 1–21 [hereinafter Burke] further in view of Chun et al., *Nurse Rostering at the Hospital Authority of Hong Kong*, American Association for Artificial Intelligence, 2000, pg. 1–6 [hereinafter Chun] further in view of Burke et al., *Fitness Evaluation for Nurse Scheduling Problems*, Proceedings of Congress on Evolutionary Computation, CEC2001, Seoul, IEEE Press, 2001, pg. 1139–46 [hereinafter Burke 2] further in view of Applicant’s Admitted Prior Art.

21. As per claims 13–14, O’Brien in view of Burke further in view of Chun further in view of Burke 2 does not explicitly teach wherein the input device is a mouse or a keyboard. However, O’Brien does teach inputting scheduling information and changes via a standard computer. Official Notice was taken and not since adequately traversed by Applicant that a standard computer comprises a mouse and keyboard for data input. As such, the limitations of claims 13–14 are considered Applicant’s Admitted Prior Art. See discussion *infra* ¶ 44. It would have been obvious to one having ordinary skill in the art at the time of the invention to modify O’Brien in view of Burke further in view of Chun further in view of Burke 2 to include the teaching of Applicant’s Admitted Prior Art, providing the benefit of user friendliness via easy and convenient means of data entry.

22. Claims 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Brien, U.S. Pat. 6,587,831 in view of Burke et al., *Variable Neighborhood Search for Nurse Rostering Problems*, Kluwer Academic Publishers, 12/19/2002, pg. 1–21 [hereinafter Burke] further in view of Chun et al., *Nurse Rostering at the Hospital Authority of Hong Kong*, American Association for Artificial Intelligence, 2000, pg. 1–6 [hereinafter Chun] further in view of Burke et al., *Fitness Evaluation for Nurse Scheduling Problems*, Proceedings of Congress on Evolutionary Computation, CEC2001, Seoul, IEEE Press, 2001, pg. 1139–46 [hereinafter Burke 2] further in view of public use of GMT Planet software, as evidenced by gmtpcorp.com, GMTPlanet, 2001, pg. 1–45, retrieved from web.archive.org, <http://web.archive.org/web/20010415113036/www.gmtpcorp.com/> [hereinafter GMTcorp.com]. (see PTO-892, 8/22/2008, page 2, ref. V)

23. As per claim 17, O'Brien in view of Burke further in view of Chun further in view of Burke 2 does not explicitly teach wherein the resources selected for the initial workforce schedule are dynamically selected. However, GMTPlanet teaches this concept in the analogous art of automated staff scheduling (GMTcorp.com, pg. 22, top of page, discussing dynamic scheduling; Scheduling Agents).

It would have been obvious to one of ordinary skill in the art to include in the automatic workforce schedule generators of O'Brien in view of Burke further in view of Chun further in view of Burke 2 to include the teaching of GMTPlanet for the benefit of a more expedient scheduling of employees, saving the company time and money. Moreover, it would have been obvious since the claimed invention is merely a combination of old elements, and in the

combination each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

24. As per claim 20, O'Brien in view of Burke further in view of Chun further in view of Burke 2 does not explicitly teach generating a color coded report to illustrate how closely the optimized workforce schedule is meeting the forecasted demand for a given position. However, GMTPlanet teaches this concept in the analogous art of automated staff scheduling (GMTcorp.com, pg. 4-5, 12-14, Figs.4-5, 12-14).

It would have been obvious to one of ordinary skill in the art to include in the automatic workforce schedule generators of O'Brien in view of Burke further in view of Chun further in view of Burke 2 to include the teaching of GMTPlanet because color-coded reports enable to scheduling entity to better pinpoint the source of deficiencies and remedy them quickly. Moreover, it would have been obvious since the claimed invention is merely a combination of old elements, and in the combination each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.



25. Claims 21–22, 26–29, 32, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Brien, U.S. Pat. 6,587,831 in view of Chun et al., *Nurse Rostering at the Hospital Authority of Hong Kong*, American Association for Artificial Intelligence, 2000, pg. 1–6, further in view of Burke et al., *Fitness Evaluation for Nurse Scheduling Problems*, Proceedings of Congress on Evolutionary Computation, CEC2001, Seoul, IEEE Press, 2001, pg. 1139–46 [hereinafter Burke 2].

26. As per claim 21, O'Brien teaches a system for automatically generating an optimized workforce schedule, comprising: a scheduling server (Fig. 1, ref. 110, Host; col. 3, lines 23–38, discussing host server capabilities); an access device communicatively coupled with the scheduling server over a data communications network, the access device configured to allow a user to interact with the scheduling server (Fig. 1, refs. 120, 130, Internet); a data storage area configured to store past schedules, forecasted demand, and employee attributes (col. 3, lines 24–27; Fig. 3, ref. 150, 152, 154, 156, and 180; Fig. 4, ref. 410); the scheduling server configured to process past schedules using a pattern recognition procedure to recognize historical shift patterns for a particular position indicated in the past schedules, wherein the historical shift patterns comprise a resource dependent shift pattern, and a time dependent shift pattern (Fig. 4; col. 5, lines 10–13, 25–37, 48–62, discussing the forecasting module analyzing intrinsic company workload data to derive optimal shift patterns and staffing requirements; col. 5, lines 30–33, discussing workload records and final staffing requirements for each shift being analyzed; lines 35–37, discussing patterns of high and low volume for various times of the day being found), the scheduling server further configured to create an initial workforce schedule based on the

historical shift patterns, forecasted demand, and employee attributes (Fig. 2, refs. 230 and 250; Fig. 4, refs. 420 and 450; col. 5, lines 48–62, col. 5, line 65–col. 6, line 2; col. 1, lines 49–51, discussing employee preferences which are taken into account in devising a schedule); and the scheduling server further configured to create an optimized workforce schedule based on user input via the access device (*id.*).

O'Brien does not explicitly teach use of a ratio dependent shift pattern based on when a certain number of a first type of position must be scheduled with a certain number of a second type of position, in its shift scheduling analysis. However, Chun, in the analogous art of nurse rostering via constraint satisfaction problem modeling, teaches ratio dependent shift patterns based on when a certain number of a first type of position must be scheduled with a certain number of a second type of position (pg. 3, Manpower Demand Constraint, "This type of constraint defines manpower requirement for a specific rank, staff group, gender or their combination in a particular shift, as well as the alternative manpower demand patterns in case the original demand cannot be satisfied. For example: □ Exactly 4 registered nurses on Monday morning can be replaced by 3 registered nurses and 1 enrolled nurse or by 2 registered nurses and 1 student nurse."). Although not explicitly recognized in the context of a historical shift pattern, applying the known technique of historical shift pattern recordation and use to predict future shifts, as taught by O'Brien as discussed above, as well as by Burke 2 as discussed below, to a known element, namely a ratio dependent shift pattern based on when a certain number of a first type of position must be scheduled with a certain number of a second type of position, would have been obvious so as to produce a predictable result and result in an improved system that maximize the productivity of available resources, avoiding the wasteful scenario wherein

capable workers are not assigned to a potential job merely because they are unaccustomed to performing said job and therefore such an arrangement goes unrecognized by the scheduling means.

O'Brien does not explicitly teach wherein the resource dependent shift pattern is based on when a resource is working a particular position. However, Chun teaches this concept because its rostering engine takes into account historical staffing data including when a resource is working a more or less desirable shift (pg. 4, "In addition, our Rostering Engine ensures that all staffs are treated fairly by using different types of historical statistics to generate the roster. The statistics indicate how "well" each staff has been treated so far, in terms of the number of more desirable or less desirable shifts assigned in the past. Based on the statistics, the Rostering Engine tries to evenly assign "good" shifts to balance out the statistics"). It would have been obvious to one having ordinary skill in the art to modify O'Brien to include the teachings of Chun for the benefit of maintaining employee productivity by providing them a fair and balanced shift schedule, avoiding the perception or reality of employee bias.

O'Brien in view of Chun does not explicitly teach wherein the time dependent shift pattern is based on when a specific task needs to be performed. However, Burke 2 teaches this concept in the analogous art of nurse scheduling problem analysis (pg. 1142, Tables 2 and 3, showing previous planning period data to be used in initialization of solution for the current planning period, the previous planning period data including particular times of shifts, morning M, late L, or night N (see Table 1) when shift-related tasks needed to be performed by people P1-P5). It would have been obvious to one having ordinary skill in the art to modify O'Brien in

view of Chun to include the teaching of Burke 2 for the benefit of a more focused analysis that meets staffing requirements while maximizing usage of time available for resource productivity.

27. As per claim 22, O'Brien teaches wherein the access device and the scheduling server are at different locations (Fig. 1, Host and Manager/Employees are at different locations).

28. As per claim 26, O'Brien teaches wherein the scheduling server is further configured to consider resources availability when creating the initial workforce schedule (col. 4, lines 13–20, discussing employee availability as an element of employee data, lines 51–52).

29. As per claim 27, O'Brien teaches wherein the scheduling server is further configured to consider a predefined number of work hours per week for an employee when creating the optimized workforce schedule (col. 3, lines 63–66, business Parameters, minimum hours per schedule per position; col. 4, lines 13–18, Employee data, minimal hours of work per schedule, lines 30–39).

30. As per claim 28, O'Brien does not explicitly teach wherein the scheduling server is further configured to consider an employee skill set when creating the optimized workforce schedule. However, Chun teaches this (pg. 5, "One potential enhancement is departmental-level rostering that further enhances staff utilization by sharing staff across wards depending on workload requirements of the wards and the skill sets of the available staff."; "pg. 4–5, "The most important objective of any workforce scheduling system is, of course, to improve the

quality of service provided by the organization. This quality of service can be ensured by scheduling an adequate number of staff with a well-balanced set of skills and experiences to handle any potential work that might be needed in the ward.”; pg. 1–2, “For example, the SRS should ensure that there is an adequate number and mixture of skilled staff present to maintain committed level of service quality.”). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify O’Brien to include the teaching of Chun for the benefit of increased efficiency and productivity by matching qualified individuals to positions for which such qualifications are demanded, otherwise being relegated to inefficiency lower productivity in the event an unqualified individual is found to be failing at an overly burdensome task.

31. As per claim 29, O’Brien in view of Chun does not explicitly teach wherein the scheduling server is further configured to consider full time and part time employee availability when creating the optimized workforce schedule. However, O’Brien does teach generating an optimized workforce schedule based on various employee availability (col. 4, lines 12–13, 19–20, 25–27, discussing availability as data input of each employee; col. 4, lines 51–58, discussing use of availability data in calculating optimal schedule; col. 9, lines 17–26, disclosing that availability can be changed from availability just on weekdays to weekdays and weekends) However, Burke 2, in the analogous art of nurse rostering problems, teaches both full time and part time employee availability as a scheduling constraint (pg. 1141, 3.3.2 Constraints defined by the work regulation). It would have been obvious to one of ordinary skill in the art to modify O’Brien in view of Chun to include the teachings of Burke 2 because the claimed invention is

merely a combination of old elements, and in the combination each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable, providing for a more accurate schedule and result in an improved system with enhanced operational efficiency.

32. As per claim 32, O'Brien in view of Chun does not explicitly teach wherein the forecasted demand comprises multiple forecasts for a particular position. However, producing a demand forecast for a particular position was rendered obvious by O'Brien as discussed above in the rejection of claim 6 above. Also, O'Brien has the capability to perform demand forecasts at different times and hence multiple forecasts (col. 1, lines 16–20; col. 8, lines 47–50; col. 14, lines 20–22). As such, it would have been obvious to one of ordinary skill in the art to modify O'Brien because the claimed invention is merely a combination of old elements, and in the combination each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable, enabling a scheduling manager be better prepared and make more informed decisions by being aware of different demand scenarios for a particular position. Furthermore, it is noted that reiterating the demand forecasting process to attain another forecast for the same position can be reasonably considered mere duplication of parts for multiplicative effect, which has no patentable significance unless new and unexpected result is produced. In re Harza, 124 USPQ 378 (CCPA 1960); St. Regis Paper Co. v. Bemis Co., 193 USPQ 8, 11; 549 F.2d 833 (7th Cir. 1977). Here, the predictable result of a second demand forecast for the position is neither new nor unexpected.

33. As per claim 34, O'Brien does not explicitly teach wherein the data storage area is coupled with a data server that is separate from the scheduling server. However, Chun teaches this (Fig. 1, showing rostering engine program and database server as separate entities). It would have been obvious to modify O'Brien to include the teaching of Chun for the benefit of increased data management and storage capabilities and enhanced ability to pinpoint the source of deficiencies with software/hardware components by segregating the components.

34. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over O'Brien, U.S. Pat. 6,587,831 in view of Chun et al., *Nurse Rostering at the Hospital Authority of Hong Kong*, American Association for Artificial Intelligence, 2000, pg. 1-6 further in view of Burke et al., *Fitness Evaluation for Nurse Scheduling Problems*, Proceedings of Congress on Evolutionary Computation, CEC2001, Seoul, IEEE Press, 2001, pg. 1139-46 [hereinafter Burke 2] further in view of Adhikari et al., U.S. Pat. No. 7,222,082 [hereinafter Adhikari] (see PTO-892, 2/28/2008, ref. E).

35. As per claim 25, O'Brien in view of Chun further in view of Burke 2 does not explicitly teach wherein the access device allows a user to adjust the forecasted demand for an employee position. However, Adhikari, in the analogous art of workforce forecasting, teaches this concept via user's ability to adjust (i.e. edit) the forecasted demand (i.e. volume) (column 10, lines 53-54). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the system of O'Brien, Chun, and Burke 2 with the feature of wherein the access device allows a user to adjust the forecasted demand for an employee as taught by Adhikari, as all prior art references mentioned above are directed to a system for automatically generating an optimized workforce schedule. The motivation for doing so would have been to provide the user more flexibility and therefore enable her to create the best workforce schedule possible, saving the company time and money in the process. Moreover, it would have been obvious since the claimed invention is merely a combination of old elements, and in the combination each element merely would have performed the same function as it did



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separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

36. Claims 30–31 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Brien, U.S. Pat. 6,587,831 in view of Chun et al., *Nurse Rostering at the Hospital Authority of Hong Kong*, American Association for Artificial Intelligence, 2000, pg. 1–6 [hereinafter Chun] further in view of Burke et al., *Fitness Evaluation for Nurse Scheduling Problems*, Proceedings of Congress on Evolutionary Computation, CEC2001, Seoul, IEEE Press, 2001, pg. 1139–46 [hereinafter Burke 2] further in view of Applicant's Admitted Prior Art.

37. As per claims 30–31, O'Brien in view of Chun further in view of Burke 2 does not explicitly teach wherein the input device is a mouse or a keyboard. However, O'Brien does teach inputting scheduling information and changes via a standard computer. Official Notice was taken and not since adequately traversed by Applicant that a standard computer comprises a mouse and keyboard for data input. As such, the limitations of claims 30–31 are considered Applicant's Admitted Prior Art. See discussion *infra* ¶ 44. It would have been obvious to one having ordinary skill in the art at the time of the invention to modify O'Brien in view of Chun further in view of Burke 2 to include the teaching of Applicant's Admitted Prior Art, providing the benefit of user friendliness via easy and convenient means of data entry.

38. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over O'Brien, U.S. Pat. 6,587,831 in view of Chun et al., *Nurse Rostering at the Hospital Authority of Hong Kong*, American Association for Artificial Intelligence, 2000, pg. 1-6 [hereinafter Chun] further in view of Burke et al., *Fitness Evaluation for Nurse Scheduling Problems*, Proceedings of Congress on Evolutionary Computation, CEC2001, Seoul, IEEE Press, 2001, pg. 1139-46 [hereinafter Burke 2] further in view of public use of GMT Planet software, as evidenced by gmtdcorp.com, GMTPlanet, 2001, pg. 1-45, retrieved from web.archive.org, <http://web.archive.org/web/20010415113036/www.gmtdcorp.com/> [hereinafter GMTcorp.com].

39. As per claim 33, O'Brien in view of Chun further in view of Burke 2 does not explicitly teach a report generator for generating a color coded report to identify how closely the optimized workforce schedule is meeting the forecasted demand for a given position. However, GMTPlanet teaches this concept in the analogous art of automated staff scheduling (GMTcorp.com, pg. 4-5, 12-14, Figs.4-5, 12-14).

It would have been obvious to one of ordinary skill in the art to include in the automatic workforce schedule generators of O'Brien in view of Chun further in view of Burke 2 to include the teaching of GMTPlanet because color-coded reports enable to scheduling entity to better pinpoint the source of deficiencies and remedy them quickly. Moreover, it would have been obvious since the claimed invention is merely a combination of old elements, and in the combination each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

***Response to Arguments***

40. Applicant's arguments filed 5/20/10 have been fully considered but they are not persuasive.

41. Applicant argues that the patterns taught by O'Brien are not patterns in resource scheduling, based on when a resource is working a particular position, therefore rendering the rejection under 35 U.S.C. 103 improper. Applicant's Remarks, 5/20/10, pg. 7. In response, Examiner respectfully disagrees. First Examiner notes that *basis on when a resource is working a particular position* is a new limitation, which Examiner has cited Chun as teaching because its rostering engine takes into account historical staffing data including when a resource is working a more or less desirable shift. See discussion supra ¶ 5. As such, this limitation is considered to be met by the combination of O'Brien in view of Burke further in view of Chun further in view of Burke 2 as discussed above in the rejection of claim 1.

42. Applicant argues that O'Brien does not teach shift patterns as they relate to when a specific task needs to be performed. Applicant's Remarks, 5/20/10, pg. 8. In response, Examiner notes that this argument is directed to a new limitation, to address which, new reference Burke 2 has been provided in the rejection of claim 1. As such, this argument is considered moot in view of the new grounds of rejection.

43. Applicant argues that the rejection under 35 U.S.C. is improper because Chun does not disclose historical shift patterns comprising a ratio dependent shift pattern, noting that Chun's

ratio-based constraints are merely for further schedule production and not from historical shift patterns. Applicant's Remarks, 5/20/10, pg. 8. In response, Examiner respectfully disagrees. As discussed in the rejection of claim 1 above, Chun teaches ratio dependent shift patterns based on when a certain number of a first type of position must be scheduled with a certain number of a second type of position (pg. 3, Manpower Demand Constraint, "This type of constraint defines manpower requirement for a specific rank, staff group, gender or their combination in a particular shift, as well as the alternative manpower demand patterns in case the original demand cannot be satisfied. For example: □ Exactly 4 registered nurses on Monday morning can be replaced by 3 registered nurses and 1 enrolled nurse or by 2 registered nurses and 1 student nurse."). Although not explicitly recognized in the context of a *historical* shift pattern, applying the known technique of historical shift pattern recordation and use to predict future shifts, as taught by O'Brien, as well as by Burke 2, to a known element, namely a ratio dependent shift pattern based on when a certain number of a first type of position must be scheduled with a certain number of a second type of position, would have been obvious so as to produce a predictable result and result in an improved system that maximize the productivity of available resources, avoiding the wasteful scenario wherein capable workers are not assigned to a potential job merely because they are unaccustomed to performing said job and therefore such an arrangement goes unrecognized by the scheduling means.

44. Regarding claim 8, Applicant has failed to rebut Examiner's Official Notice that a standard computer comprising a mouse and keyboard for data input was old and well known in

the art at the time of the invention. Examiner notes the following discussion of Official Notice taken from the MPEP:

To adequately traverse such a finding, an applicant must specifically point out the supposed errors in the examiner's action, which would include stating why the noticed fact is not considered to be common knowledge or well-known in the art. See 37 CFR 1.111(b). See also *Chevenard*, 139 F.2d at 713, 60 USPQ at 241 ("[I]n the absence of any demand by appellant for the examiner to produce authority for his statement, we will not consider this contention."). A general allegation that the claims define a patentable invention without any reference to the examiner's assertion of official notice would be inadequate. If applicant adequately traverses the examiner's assertion of official notice, the examiner must provide documentary evidence in the next Office action if the rejection is to be maintained. See 37 CFR 1.104(c)(2). See also *Zurko*, 258 F.3d at 1386, 59 USPQ2d at 1697 ("[T]he Board [or examiner] must point to some concrete evidence in the record in support of these findings" to satisfy the substantial evidence test). If the examiner is relying on personal knowledge to support the finding of what is known in the art, the examiner must provide an affidavit or declaration setting forth specific factual statements and explanation to support the finding. See 37 CFR 1.104(d)(2). If applicant does not traverse the examiner's assertion of official notice or applicant's traverse is not adequate, the examiner should clearly indicate in the next Office action that the common knowledge or well-known in the art statement is taken to be admitted prior art because applicant either failed to traverse the examiner's assertion of official notice or that the traverse was inadequate. If the traverse was inadequate, the examiner should include an explanation as to why it was inadequate. (MPEP § 2144.03(C))

Applicant has not "specifically point[ed] out the supposed errors in the examiner's action, which would include stating why the noticed fact is not considered to be common knowledge or well-known in the art." For this reason, a standard computer comprising a mouse and keyboard for data input is taken to be admitted prior art.

***Conclusion***

45. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A. Dowsland and Thompson, *Solving a nurse scheduling problem with knapsacks, networks and tabu search*, Journal of the Operational Research Society, Vol. 51, 2000, pg. 825–833 (disclosing a shift scheduling algorithm that depends on recent work history including the amount of weekend and night working).

B. Aickelin and Dowsland, *Exploiting problem structure in a genetic algorithm approach to a nurse rostering problem*, Journal of Scheduling, Vol. 3, no. 3, 2000, pg. 139–53 (disclosing a nurse scheduling algorithm considering historical information to ensure that unsatisfied requests and unpopular shifts are evenly distributed).

C. Miller et al., *Nurse Scheduling Using Mathematical Programming*, Operations Research, Vol. 24, No. 5, Sept–Oct 1976, pg. 857–70 (analyzing the nurse-scheduling problem including consideration of nurse's schedule history in determining future schedule, wherein revised schedules are weighed based on how good or bad a nurse's previous schedule was).

46. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

47. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JUSTIN M. PATS whose telephone number is (571)270-1363. The examiner can normally be reached on M-F, 8am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Beth Boswell can be reached on 571-272-6737. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Justin M Pats/  
Examiner, Art Unit 3623

/Andre Boyce/  
Primary Examiner, Art Unit 3623